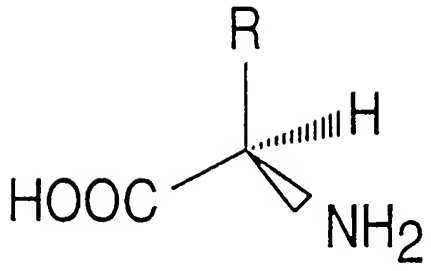
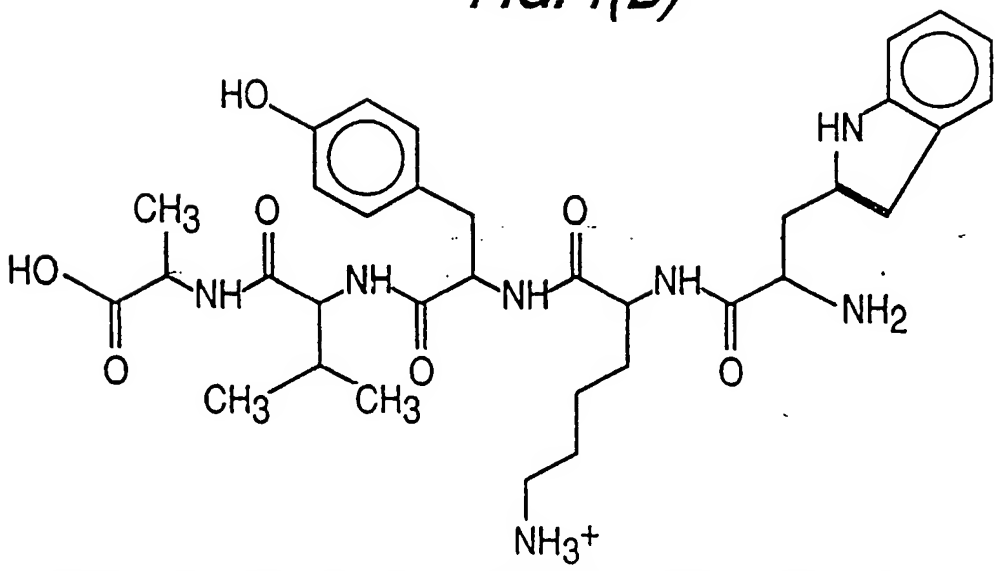
FIG. 1(A)



R = —CH_3 ALANINE

R = —$CH(CH_3)_2$ VALINE

FIG. 1(B)



$^-$OOC—ALANINE-VALINE-TYROSINE-LYSINE-TRYPTOPHAN—NH_3^+

FIG. 2

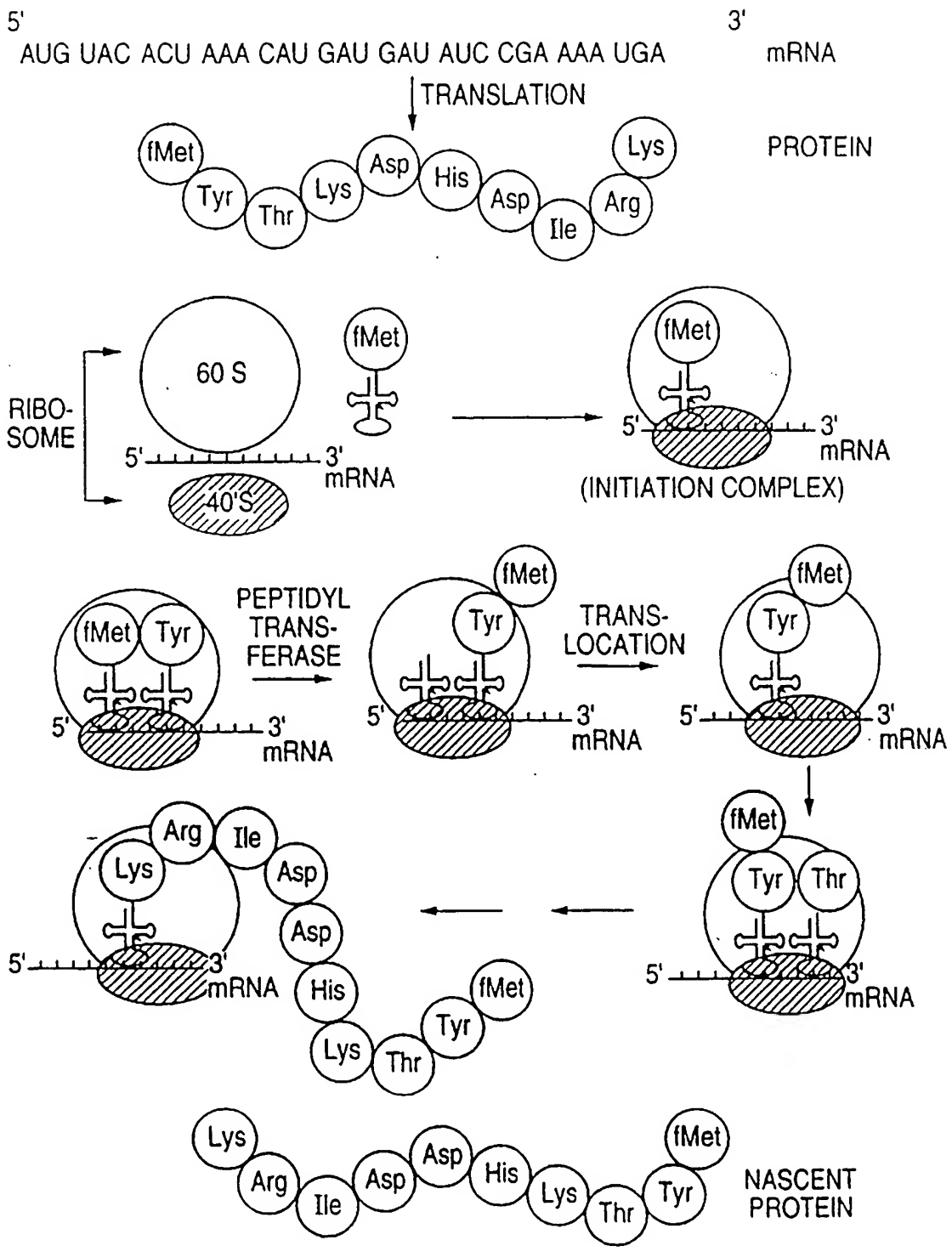

5'
3'
AUG UAC ACU AAA CAU GAU GAU AUC CGA AAA UGA
mRNA
TRANSLATION
PROTEIN
fMet
Tyr
Thr
Lys
Asp
His
Asp
Ile
Arg
Lys
RIBO-
SOME
60 S
40'S
fMet
5'
3'
mRNA
(INITIATION COMPLEX)
PEPTIDYL
TRANS-
FERASE
TRANS-
LOCATION
Arg
Ile
Asp
Asp
His
NASCENT
PROTEIN

FIG. 3(A)

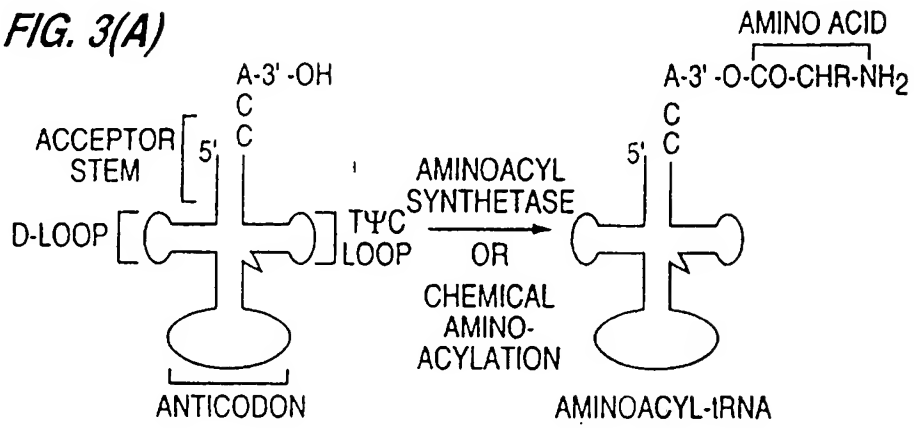

A-3' -OH
C
C
ACCEPTOR STEM
5'
D-LOOP
TΨC LOOP
ANTICODON
AMINOACYL SYNTHETASE
OR
CHEMICAL AMINO-ACYLATION
AMINO ACID
A-3' -O-CO-CHR-NH2
AMINOACYL-tRNA

FIG. 3(B)

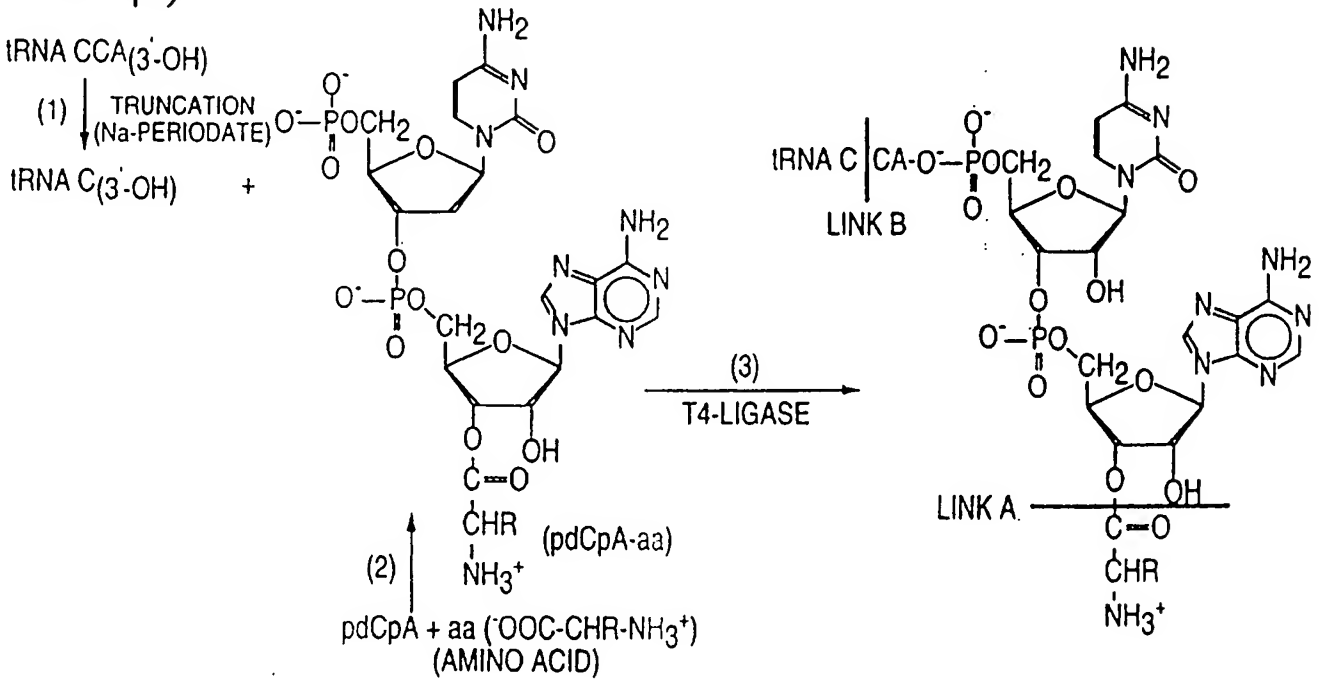

tRNA CCA(3'-OH)
(1)
TRUNCATION (Na-PERIODATE)
tRNA C(3'-OH)
+
(2)
pdCpA + aa (-OOC-CHR-NH3+)
(AMINO ACID)
(pdCpA-aa)
(3)
T4-LIGASE
tRNA C CA-O-
LINK B
LINK A

FIG. 4

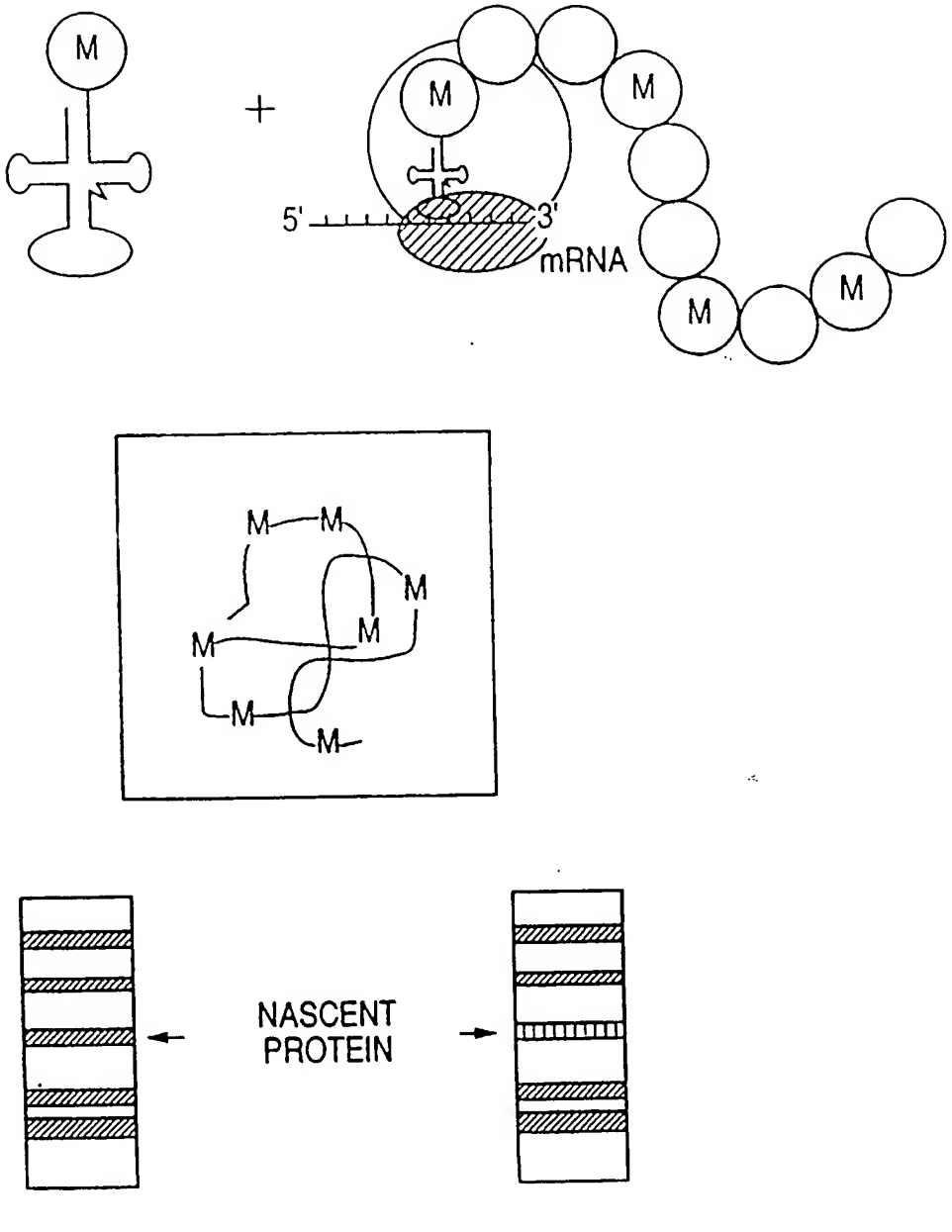


FIG. 5

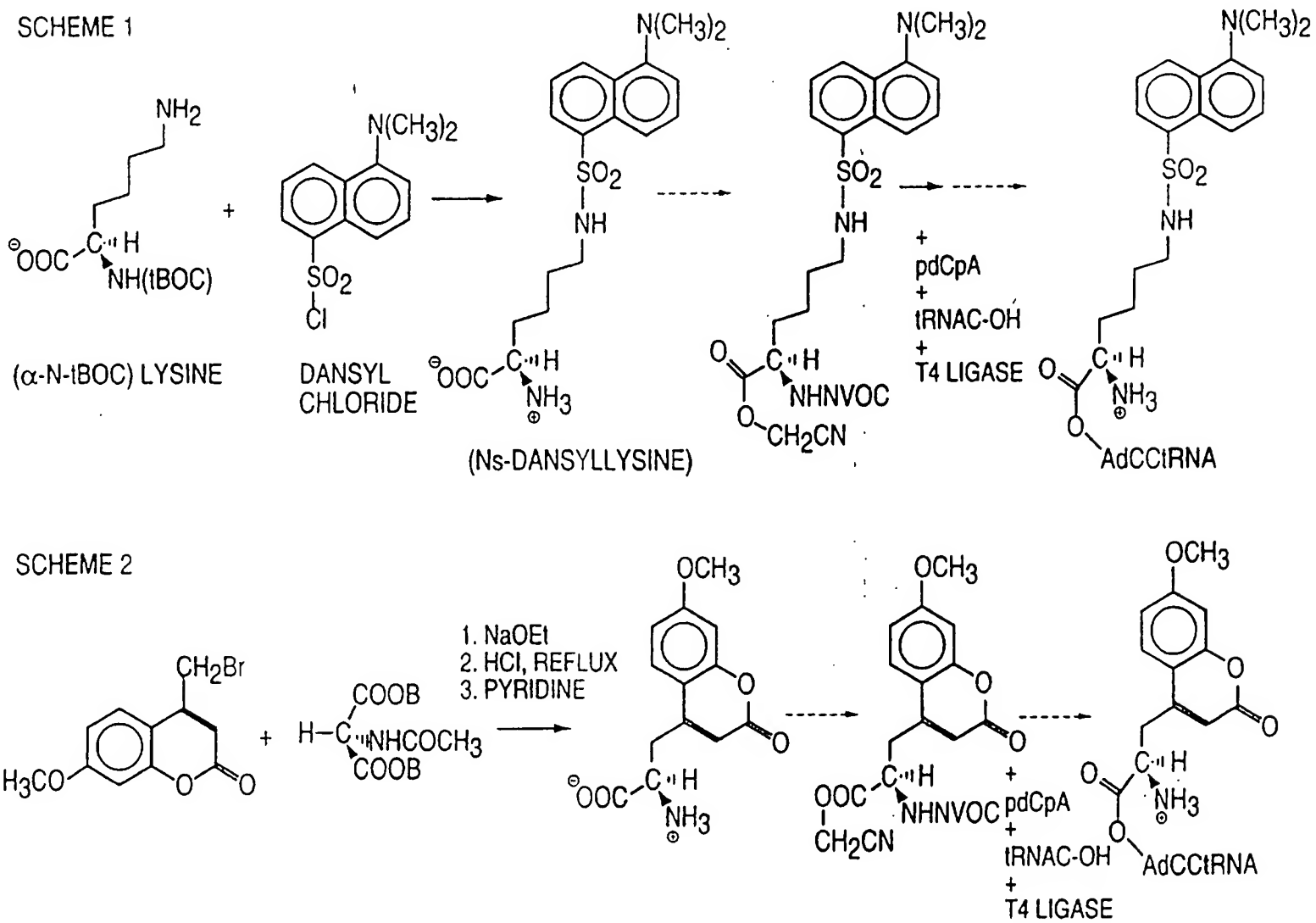

SCHEME 1
(α-N-tBOC) LYSINE
DANSYL CHLORIDE
(Ns-DANSYLLYSINE)
pdCpA
tRNAC-OH
T4 LIGASE
AdCCtRNA
SCHEME 2
1. NaOEt
2. HCl, REFLUX
3. PYRIDINE
pdCpA
tRNAC-OH
T4 LIGASE
AdCCtRNA

FIG. 6(A)

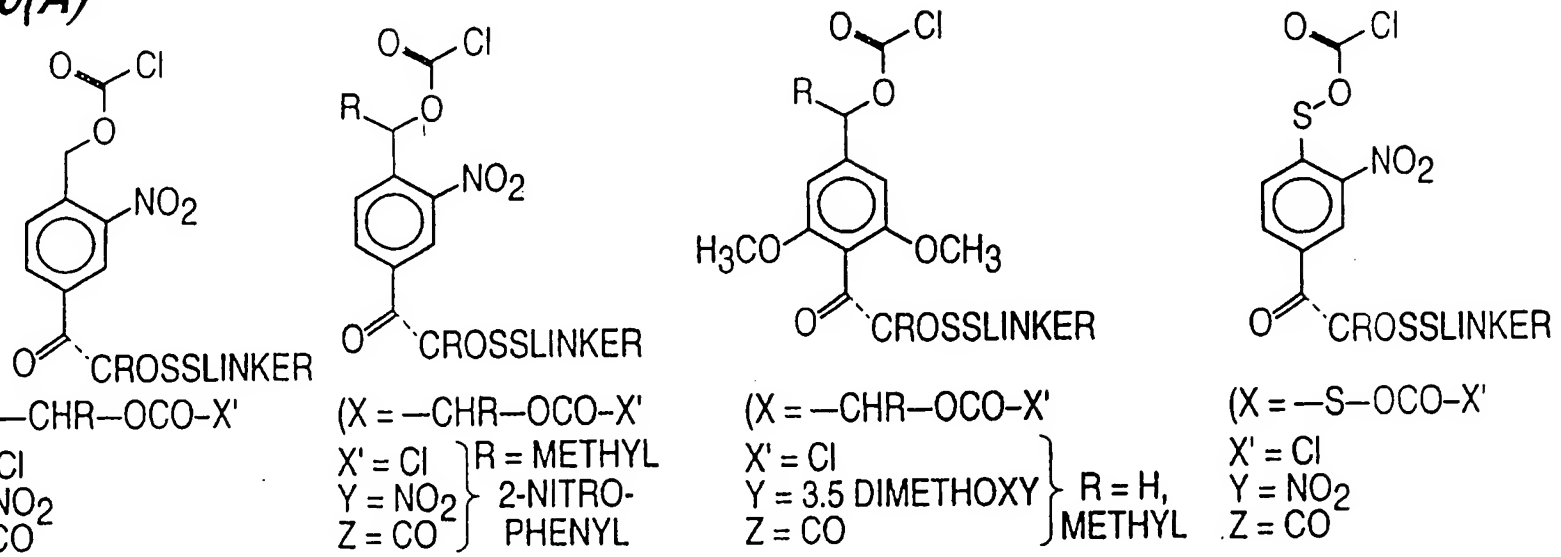

(X = —CHR—OCO-X'
X' = Cl
Y = NO2
Z = CO
(X = —CHR—OCO-X'
X' = Cl
Y = NO2
Z = CO
R = METHYL
2-NITRO-
PHENYL
(X = —CHR—OCO-X'
X' = Cl
Y = 3.5 DIMETHOXY
Z = CO
R = H,
METHYL
(X = —S—OCO-X'
X' = Cl
Y = NO2
Z = CO
CROSSLINKER

FIG. 6(B)

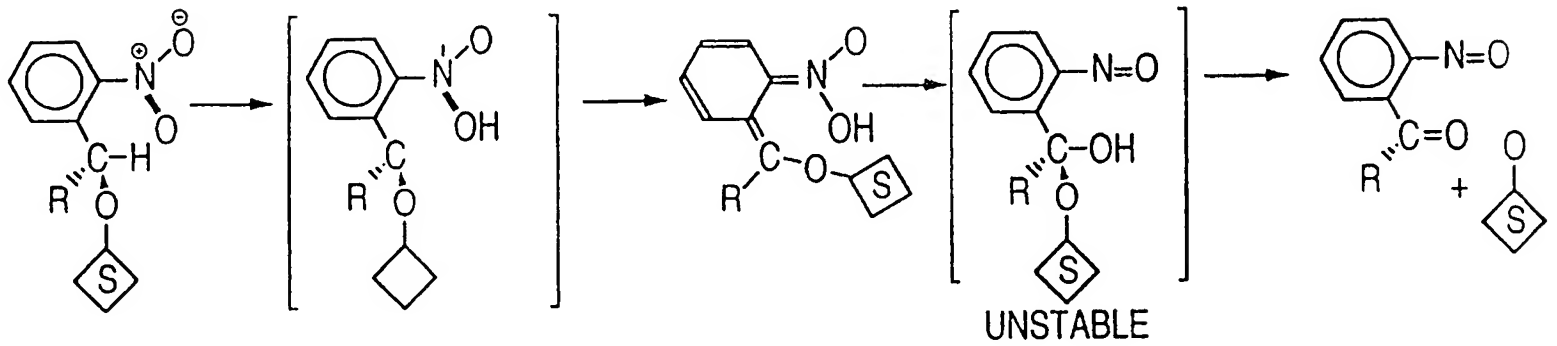

UNSTABLE

FIG. 7

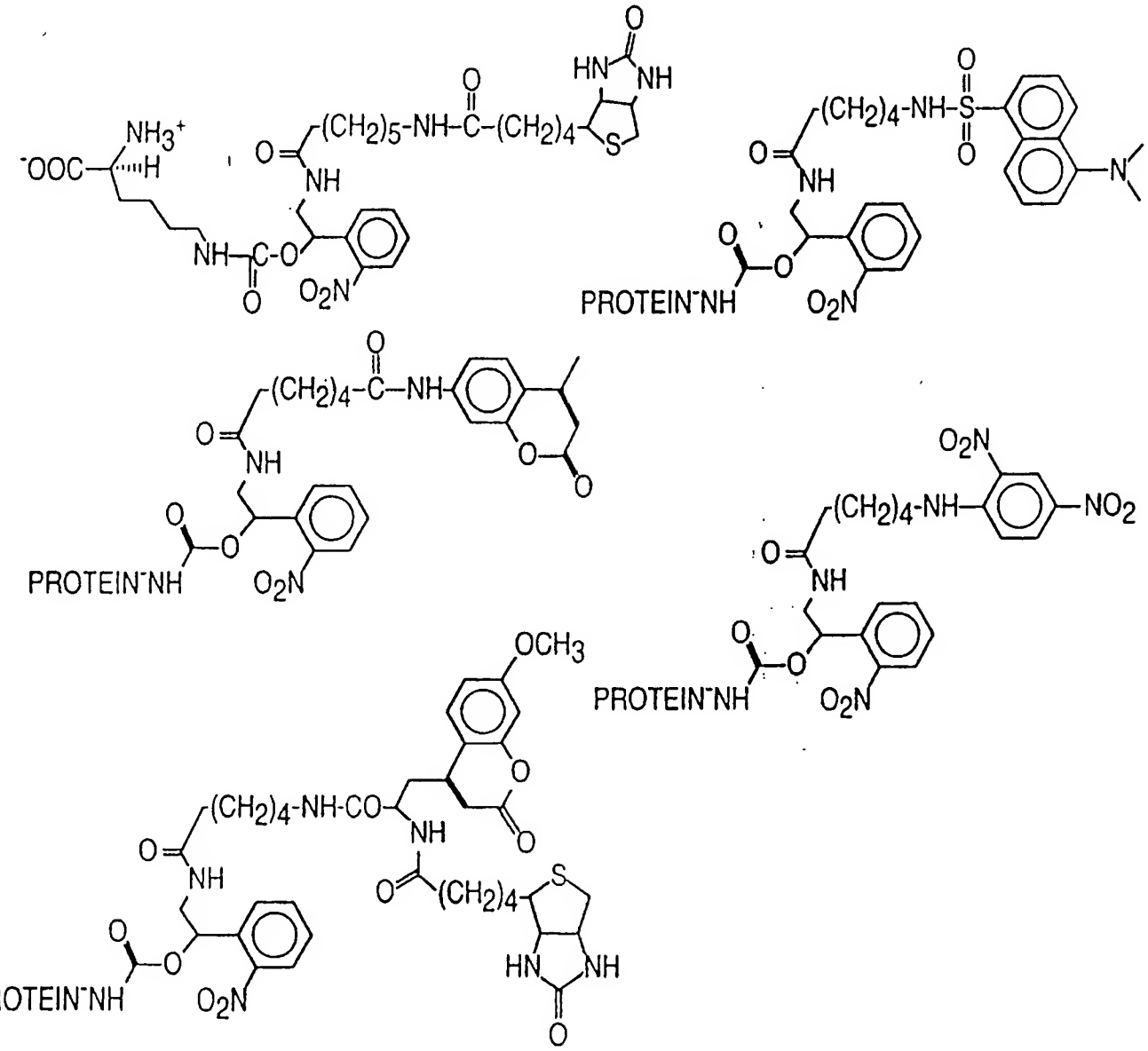

NH3+
-OOC
(CH2)5-NH-C-(CH2)4
HN
NH
S
O
NH
NH-C-O
O2N
(CH2)4-NH-S
N
PROTEIN-NH
(CH2)4-C-NH
O2N
NO2
OCH3
(CH2)4-NH-CO
(CH2)4

FIG. 8(A)

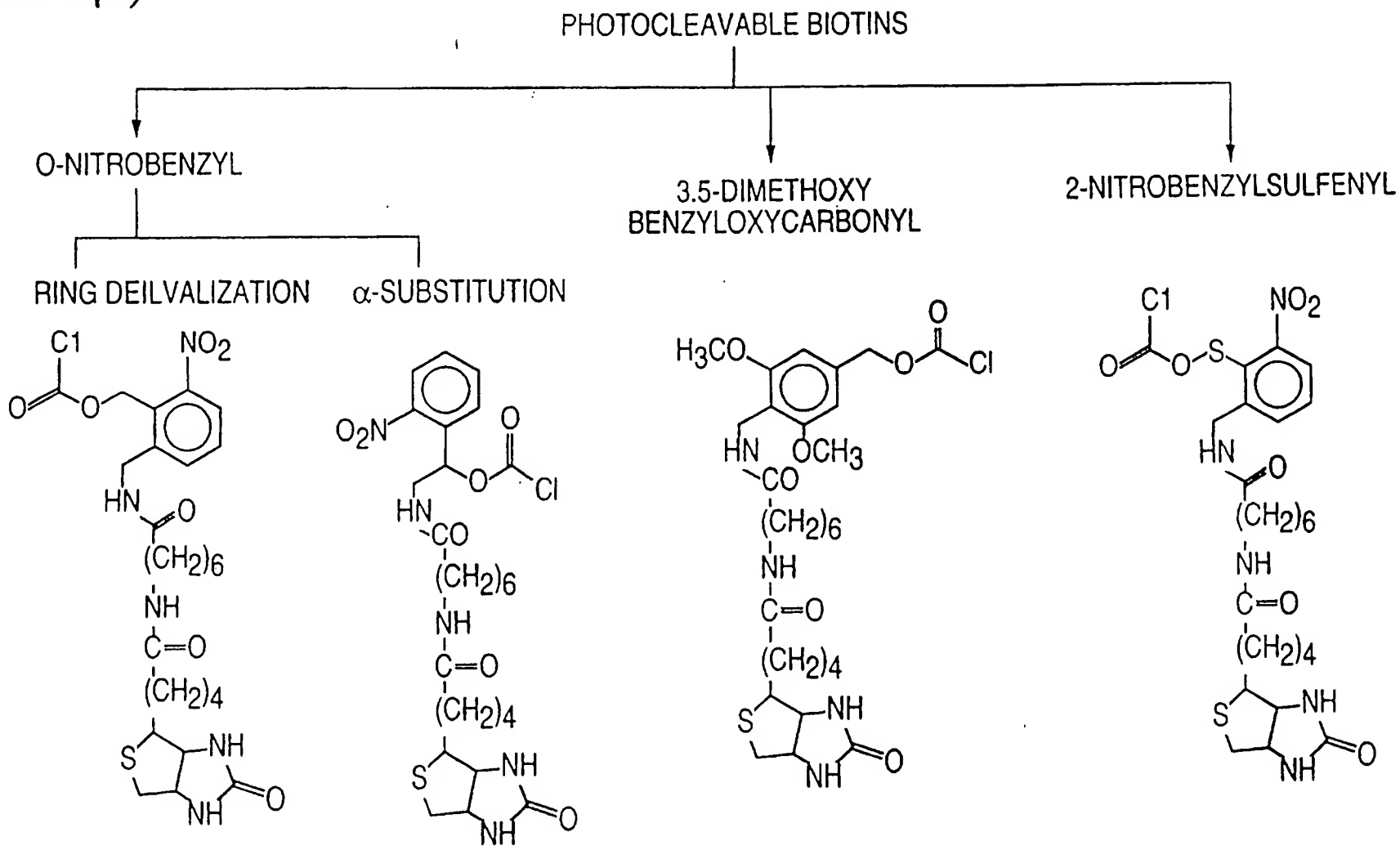

PHOTOCLEAVABLE BIOTINS
O-NITROBENZYL
RING DEILVALIZATION
α-SUBSTITUTION
3.5-DIMETHOXY BENZYLOXYCARBONYL
2-NITROBENZYLSULFENYL

FIG. 8(B)

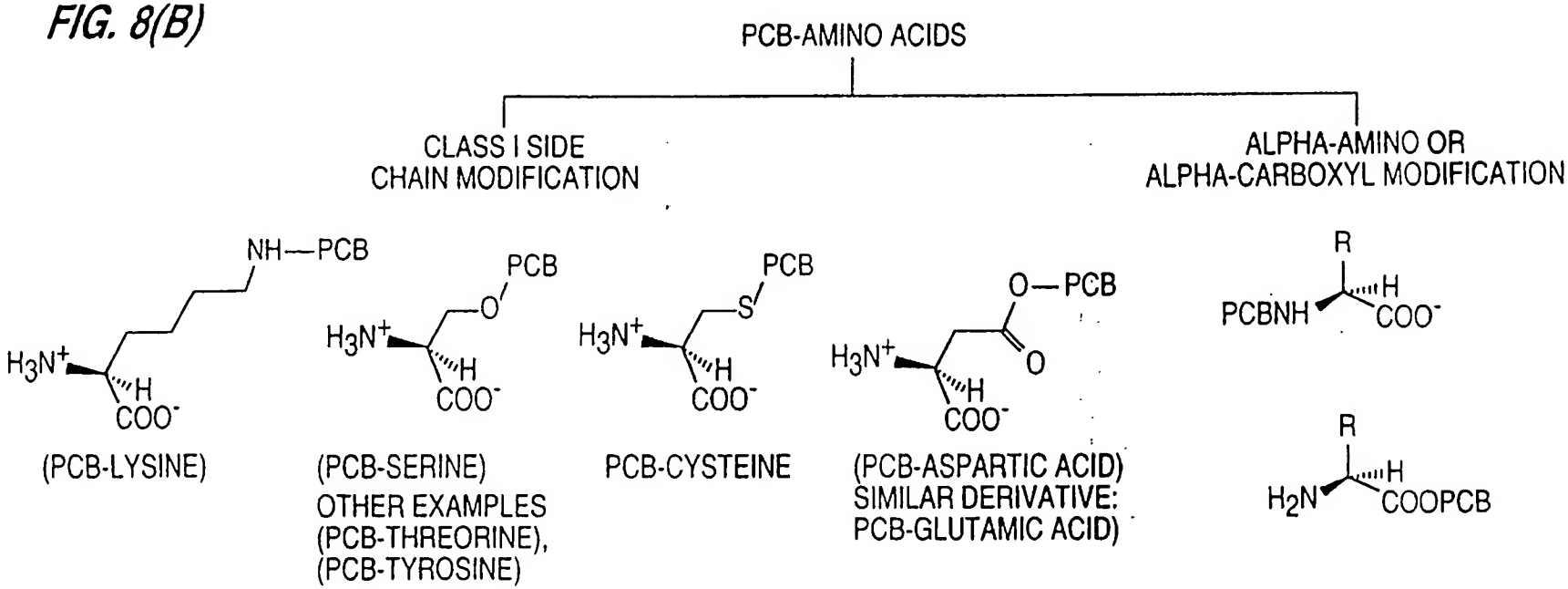

PCB-AMINO ACIDS
CLASS I SIDE CHAIN MODIFICATION
ALPHA-AMINO OR ALPHA-CARBOXYL MODIFICATION
NH—PCB
H3N+
H
COO-
(PCB-LYSINE)
PCB
O
(PCB-SERINE)
OTHER EXAMPLES (PCB-THREORINE), (PCB-TYROSINE)
S
PCB-CYSTEINE
O—PCB
O
(PCB-ASPARTIC ACID)
SIMILAR DERIVATIVE: PCB-GLUTAMIC ACID)
R
PCBNH
H2N
COOPCB

FIG. 9

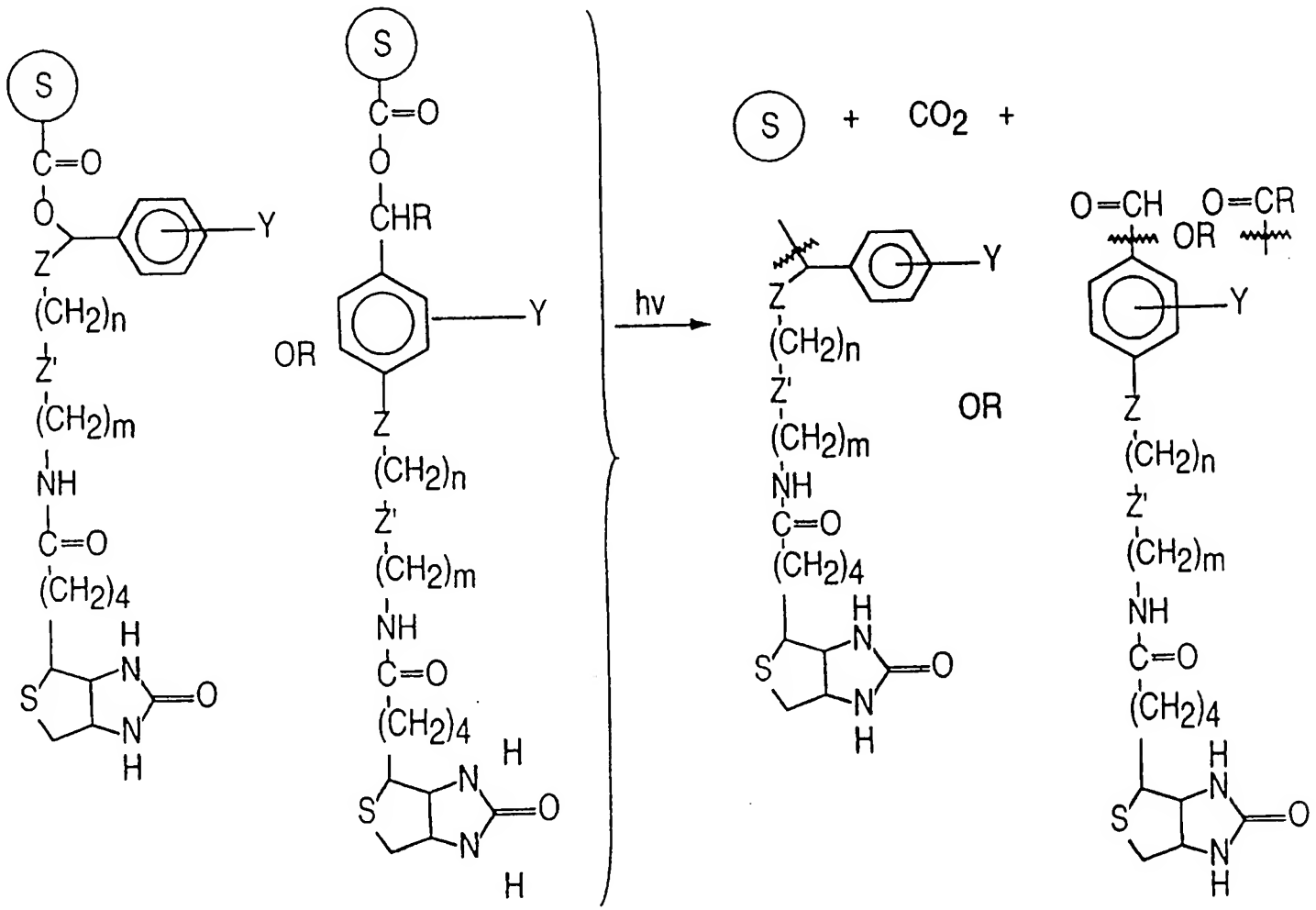


FIG. 10

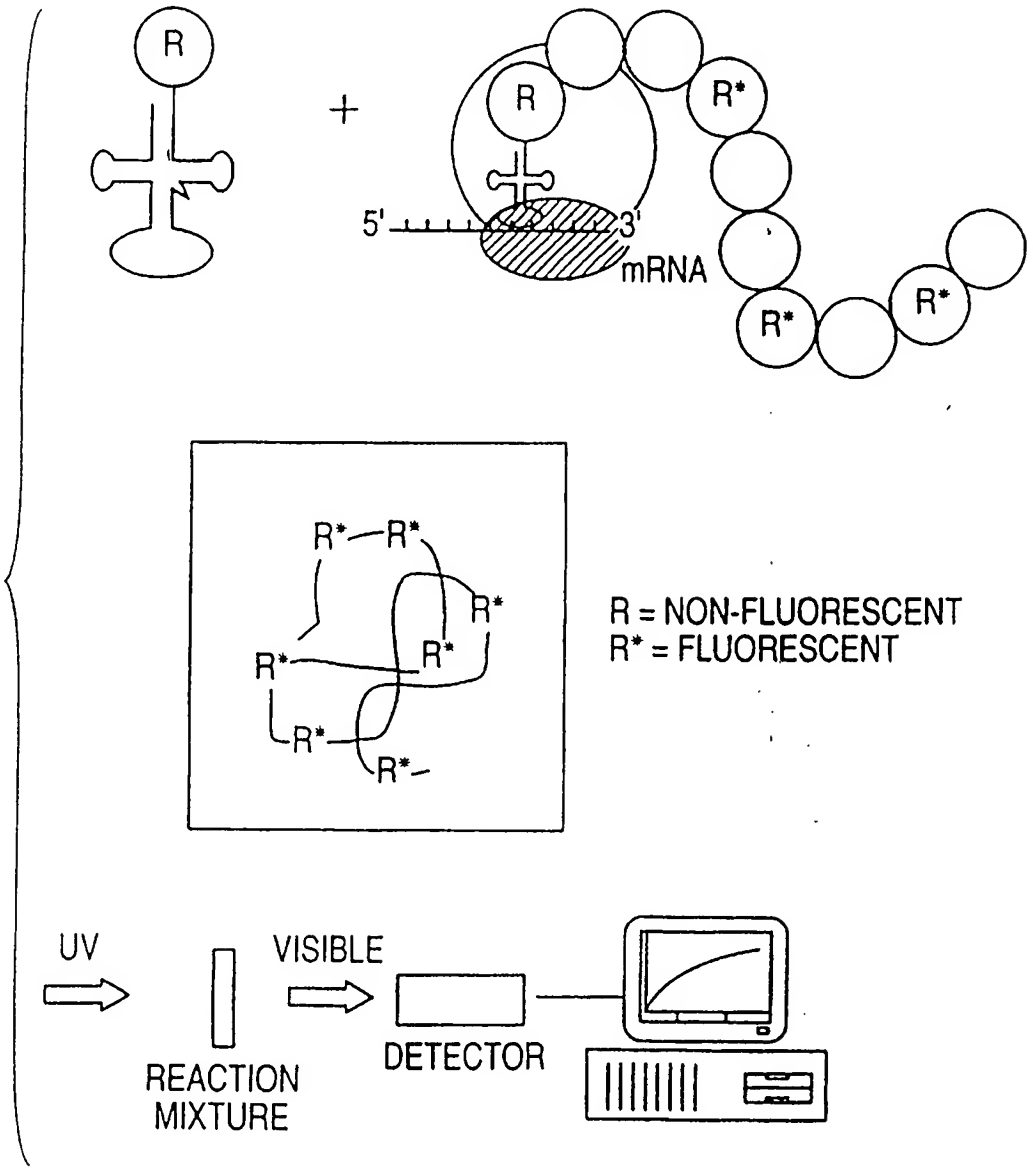

R
R
R*
5'
3'
mRNA
R*
R*
R*—R*
R*
R*
R*
R*
R*—
R = NON-FLUORESCENT
R* = FLUORESCENT
UV
VISIBLE
REACTION MIXTURE
DETECTOR

FIG. 11

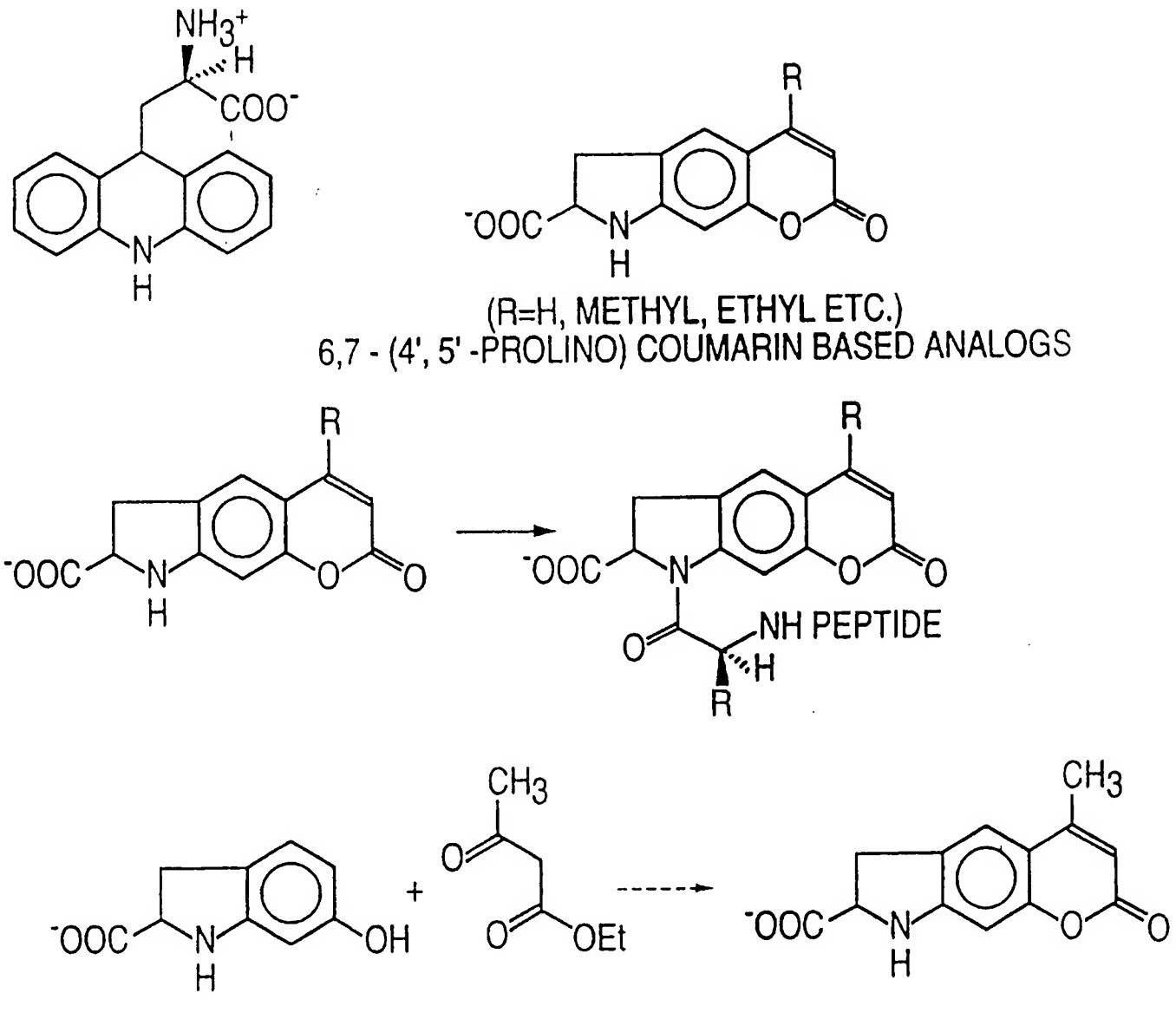

NH3+
H
COO-
N
H
R
-OOC
N
H
O
O
(R=H, METHYL, ETHYL ETC.)
6,7 - (4', 5' -PROLINO) COUMARIN BASED ANALOGS
R
-OOC
N
H
O
O
R
-OOC
N
O
O
NH PEPTIDE
O
H
R
CH3
-OOC
N
H
OH
+
O
O
OEt
CH3
-OOC
N
H
O
O

FIG. 12

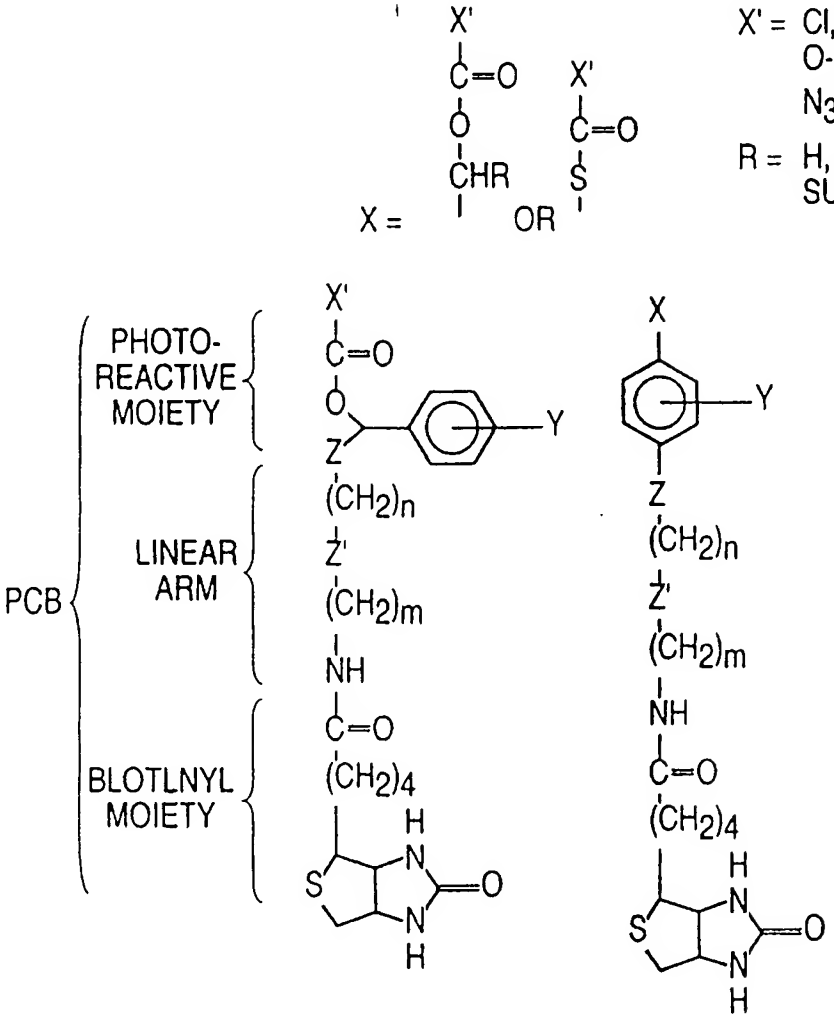

X' = Cl, O-NHYDROXYSUCCINIMIDYL, O-CH2CN, OPhF5, OPhCl5, N3 ETC. (REACTIVE DERIVATIVE)
R = H, ALKYL, SUBSTITUTED ALKYL, ARYL, SUBSTITUTE ARYL
X =
PCB
PHOTO-REACTIVE MOIETY
LINEAR ARM
BLOTLNYL MOIETY
Y = (POLY) NO2, ALKYL, ALKOXYL
Z = C, C–N, N–C, NH, O, S, CH2
n = 0, 1, 2 . . . . (n = 0, Z = 0)
Z' = AS FOR Z (Z = Z' OR Z ≠ Z')
m = 0, 1, 2 . . . . (m = 0, Z = 0)

FIG. 13

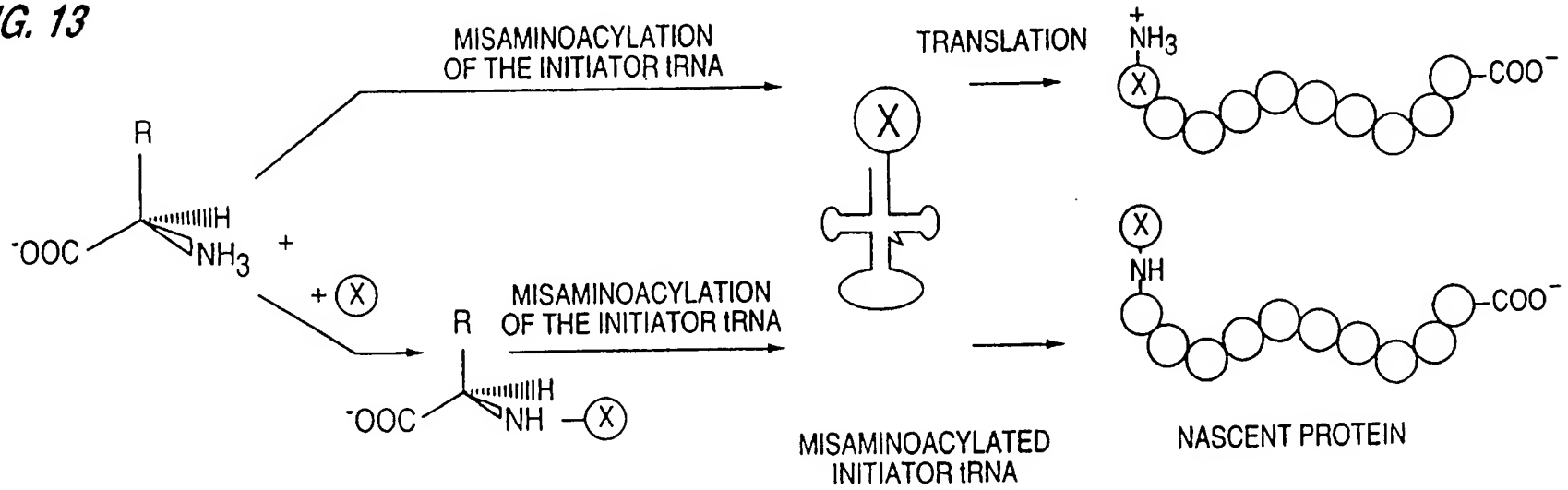

MISAMINOACYLATION
OF THE INITIATOR tRNA
TRANSLATION
R
-OOC
NH3
+
+ X
MISAMINOACYLATION
OF THE INITIATOR tRNA
R
-OOC
NH
X
X
MISAMINOACYLATED
INITIATOR tRNA
+
NH3
X
-COO-
X
NH
-COO-
NASCENT PROTEIN

FIG. 14

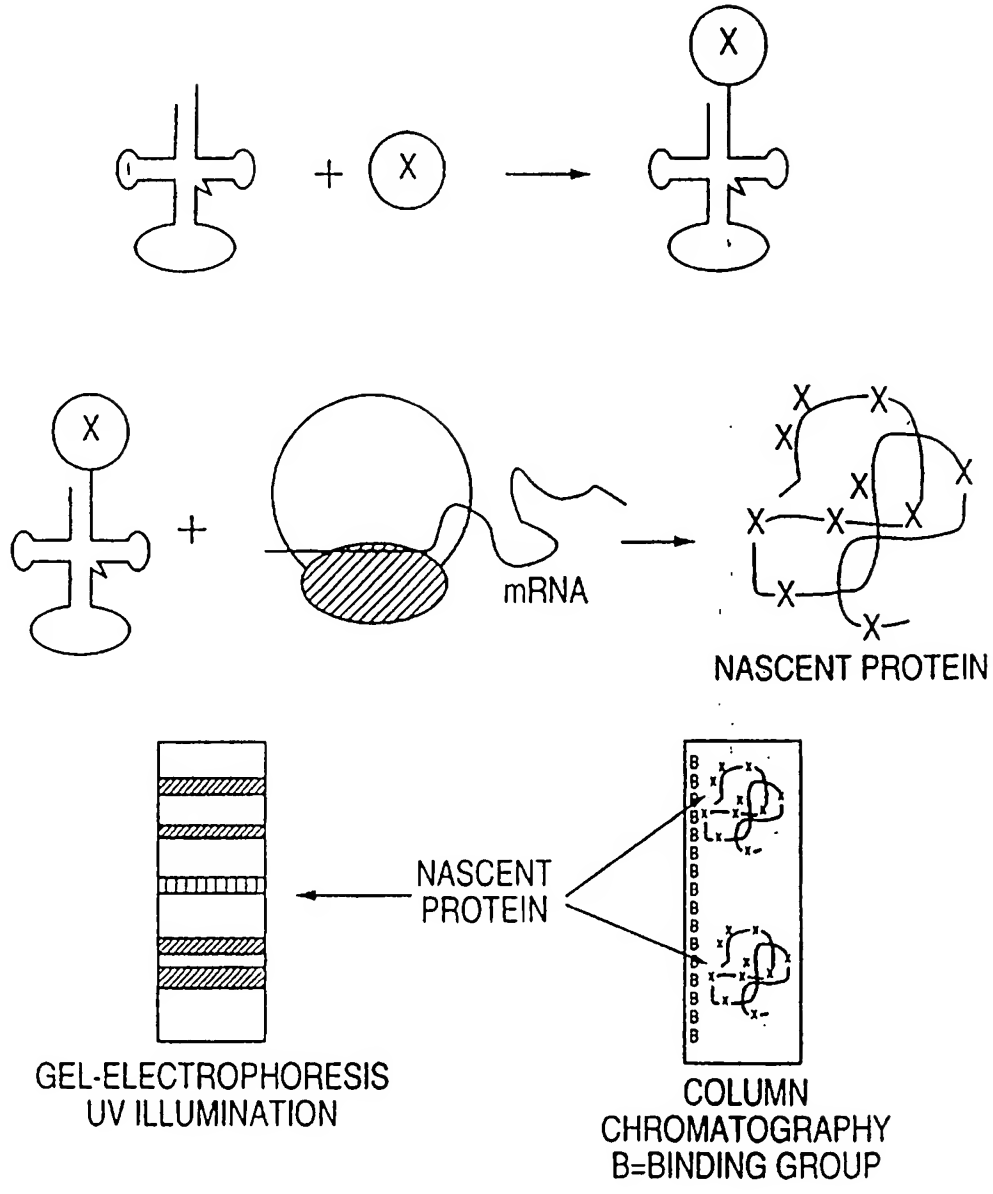

X
X
mRNA
NASCENT PROTEIN
NASCENT
PROTEIN
GEL-ELECTROPHORESIS
UV ILLUMINATION
COLUMN
CHROMATOGRAPHY
B=BINDING GROUP

FIG. 15

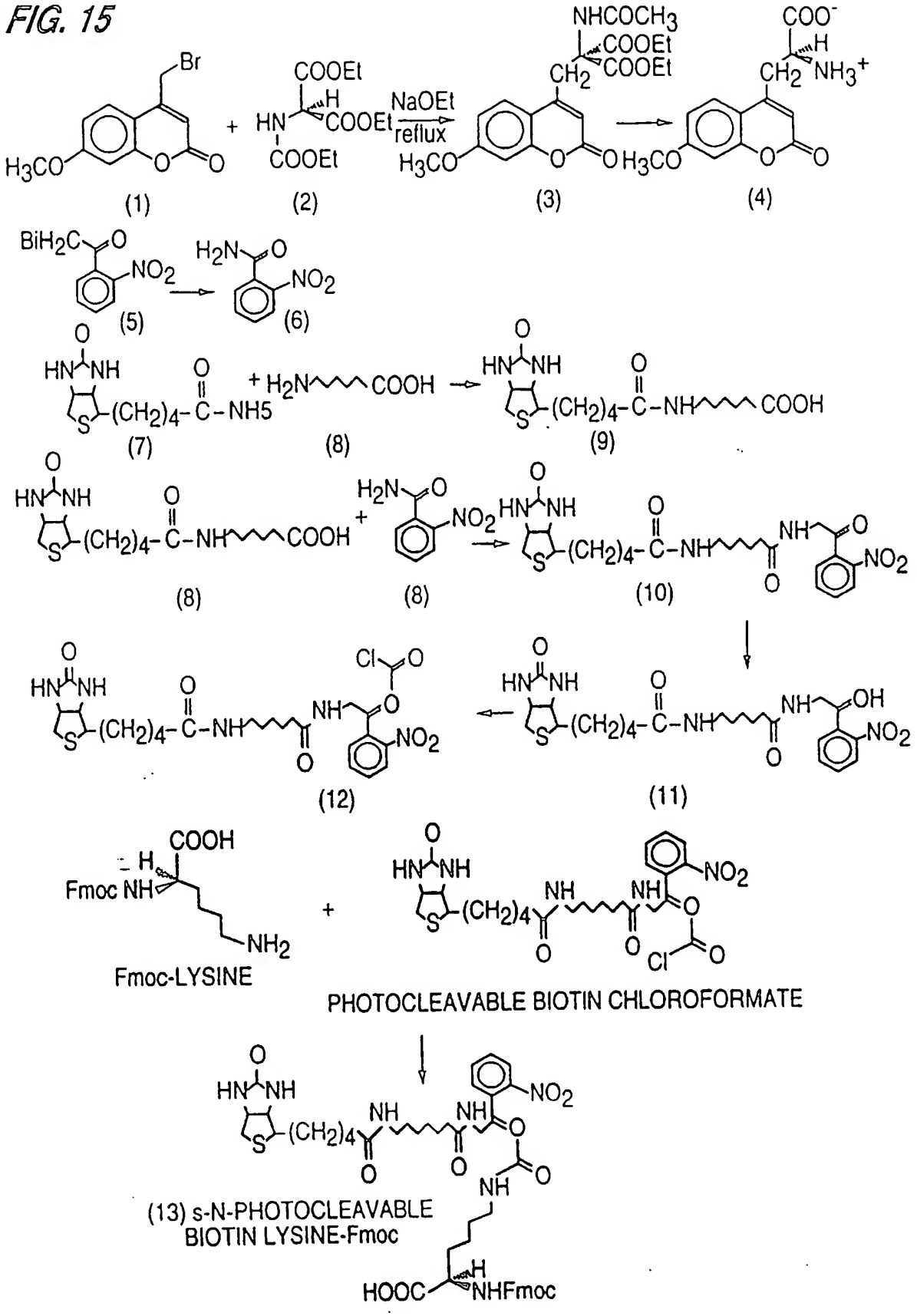

(1)
(2)
(3)
(4)
(5)
(6)
(7)
(8)
(9)
(8)
(8)
(10)
(12)
(11)
Fmoc-LYSINE
PHOTOCLEAVABLE BIOTIN CHLOROFORMATE
(13) s-N-PHOTOCLEAVABLE BIOTIN LYSINE-Fmoc

FIG. 16

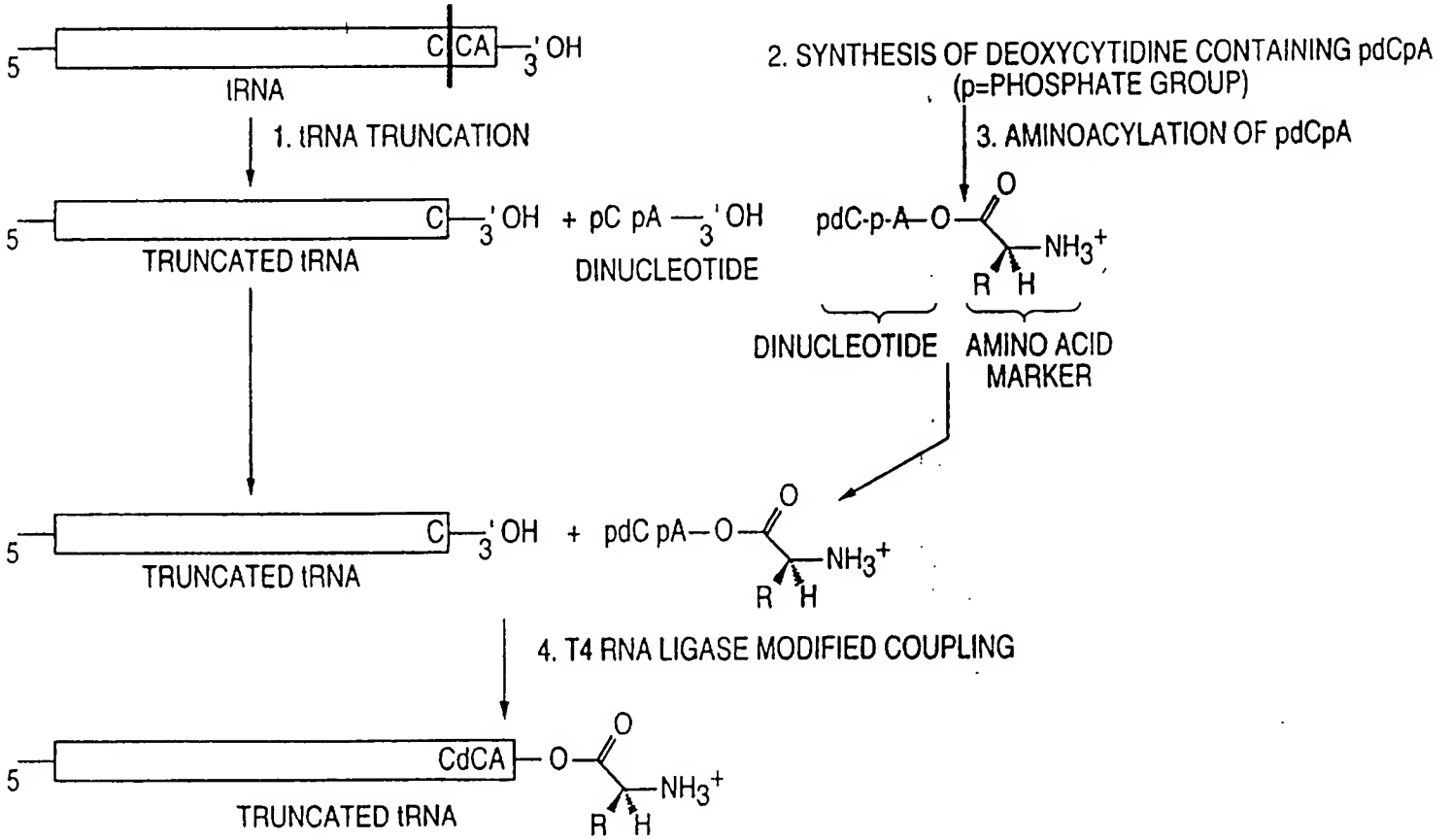

5
C CA
3' OH
tRNA
1. tRNA TRUNCATION
5
C
3' OH
TRUNCATED tRNA
+ pC pA
3' OH
DINUCLEOTIDE
2. SYNTHESIS OF DEOXYCYTIDINE CONTAINING pdCpA
(p=PHOSPHATE GROUP)
3. AMINOACYLATION OF pdCpA
pdC-p-A-O
O
NH3+
R H
DINUCLEOTIDE
AMINO ACID
MARKER
5
C
3' OH
TRUNCATED tRNA
+ pdC pA-O
O
NH3+
R H
4. T4 RNA LIGASE MODIFIED COUPLING
5
CdCA
O
O
NH3+
R H
TRUNCATED tRNA

FIG. 17

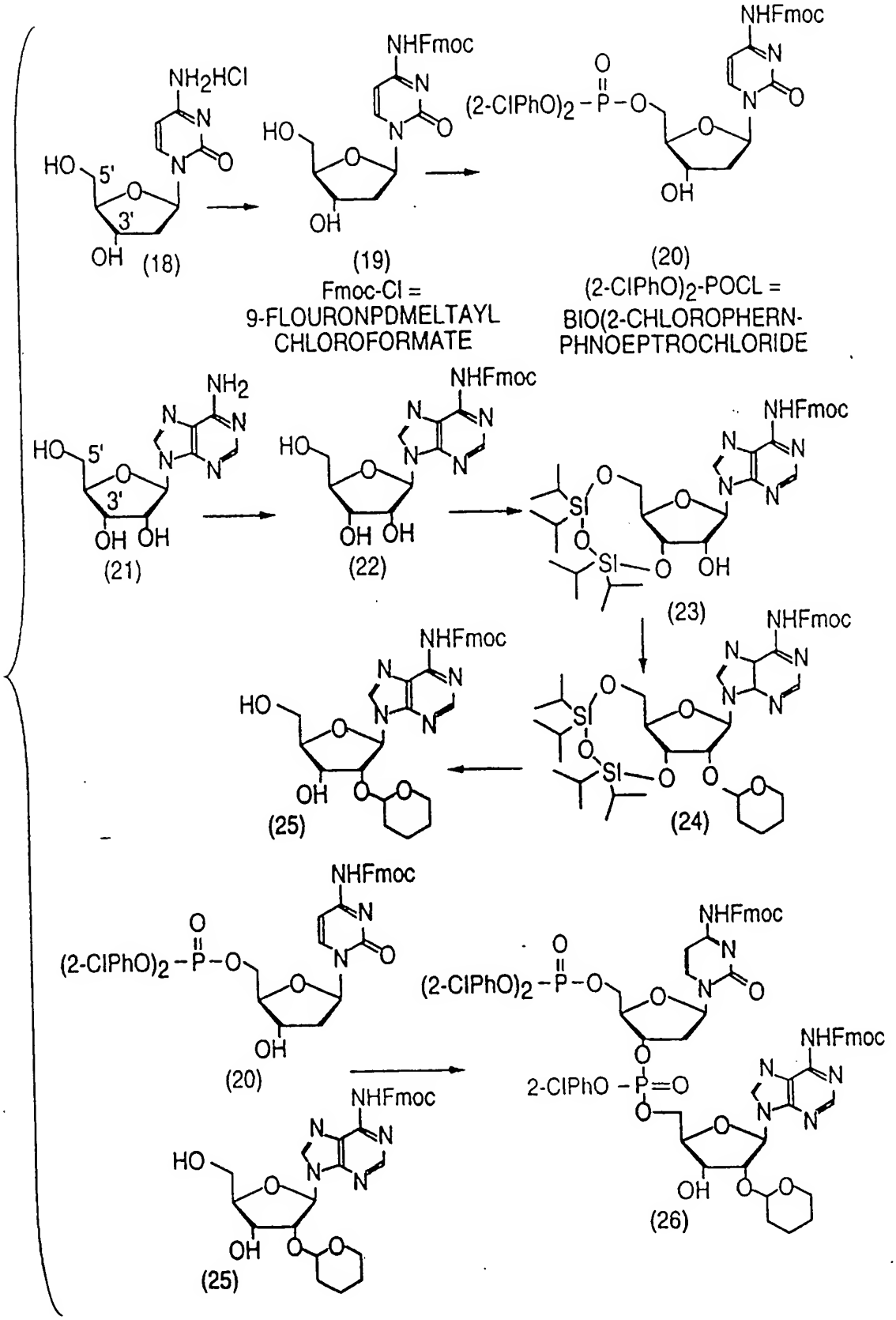
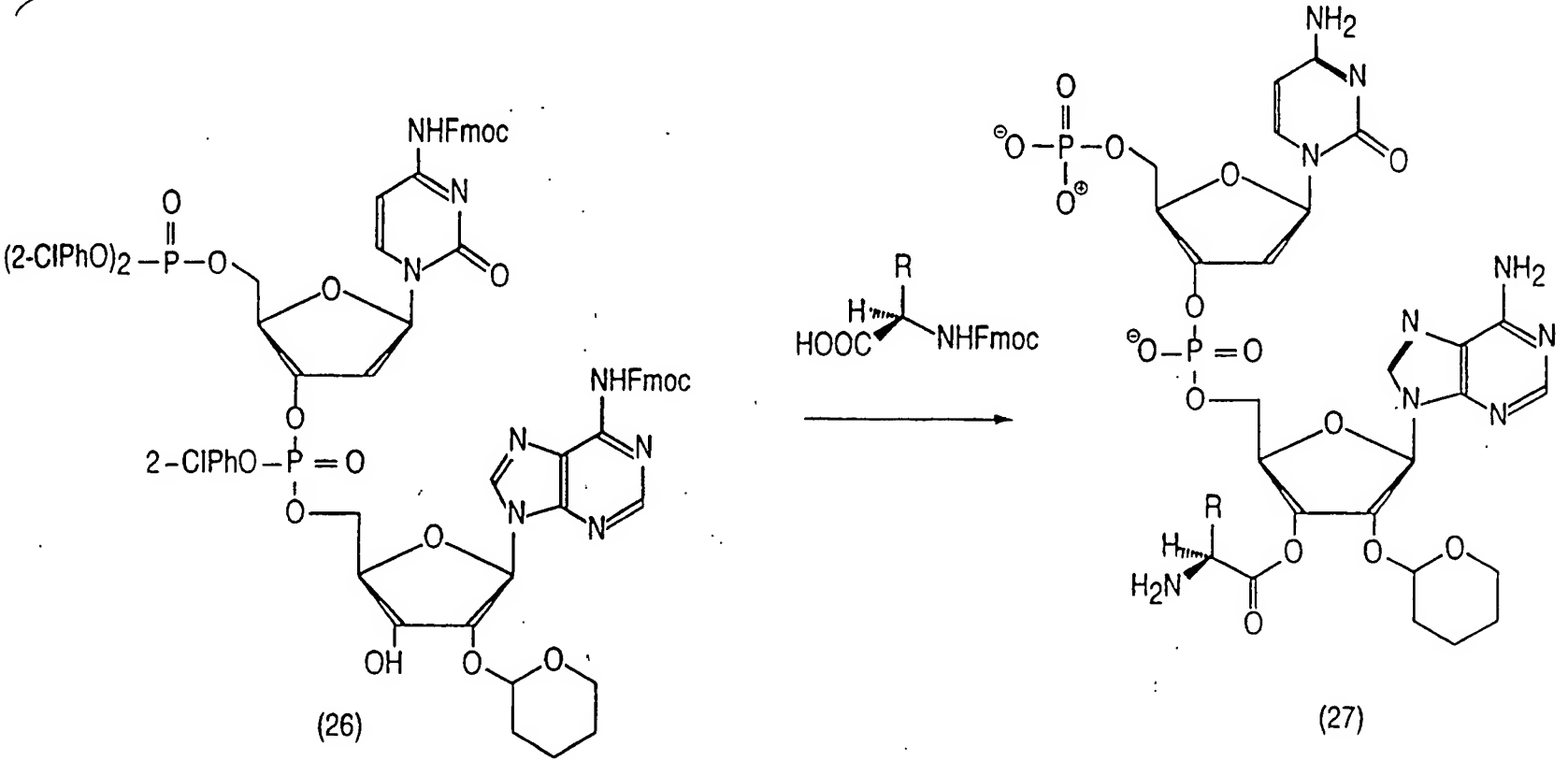

NH2HCl
HO
5'
3'
OH
(18)
NHFmoc
(19)
Fmoc-Cl =
9-FLOURONPDMELTAYL
CHLOROFORMATE
(2-ClPhO)2-P-O
(20)
(2-ClPhO)2-POCL =
BIO(2-CHLOROPHERN-
PHNOEPTROCHLORIDE
(21)
(22)
(23)
(24)
(25)
2-ClPhO-P=O
(26)

FIG. 18


NHFmoc
(2-ClPhO)2 –P–O
2-ClPhO–P = O
NHFmoc
OH
(26)
R
H
HOOC
NHFmoc
NH2
NH2
R
H
H2N
(27)

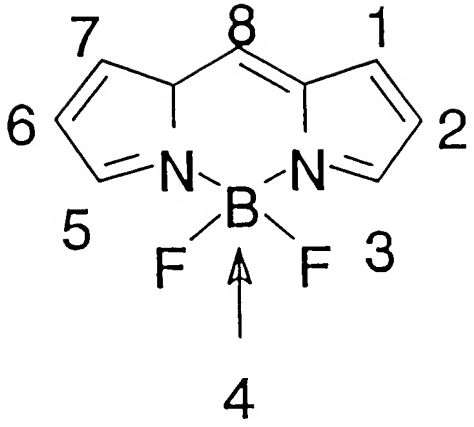
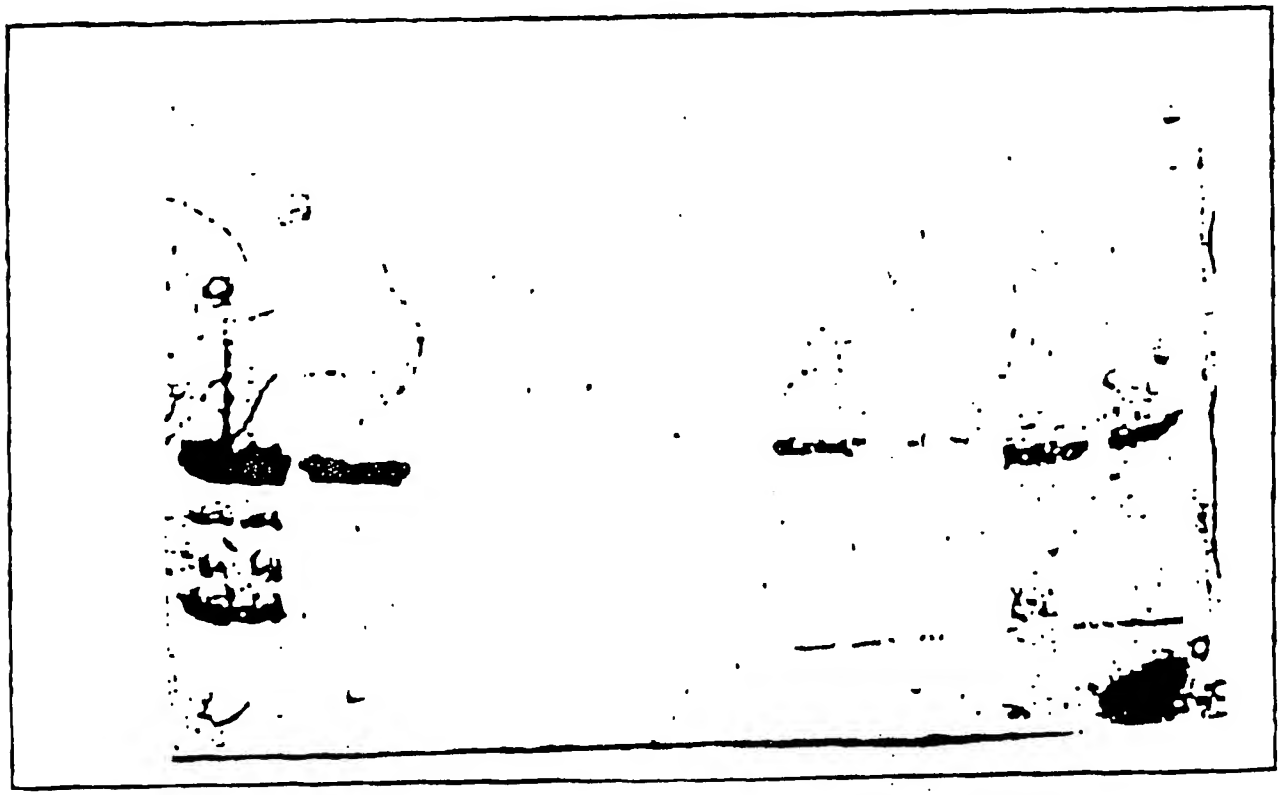


Figure 19



1 2 3 4 5 6 7 8 9 10

Figure 20

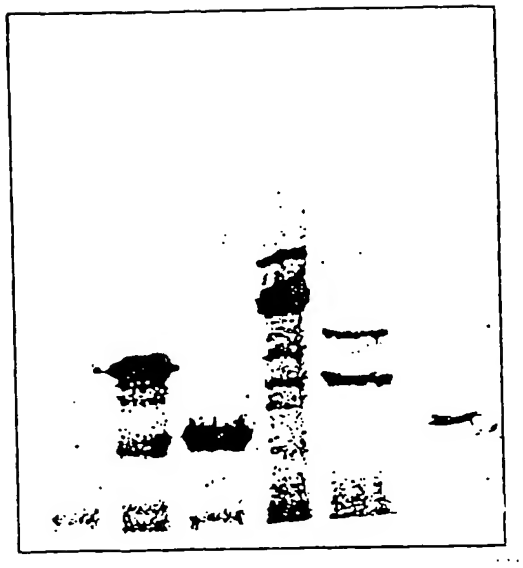


Figure 21A

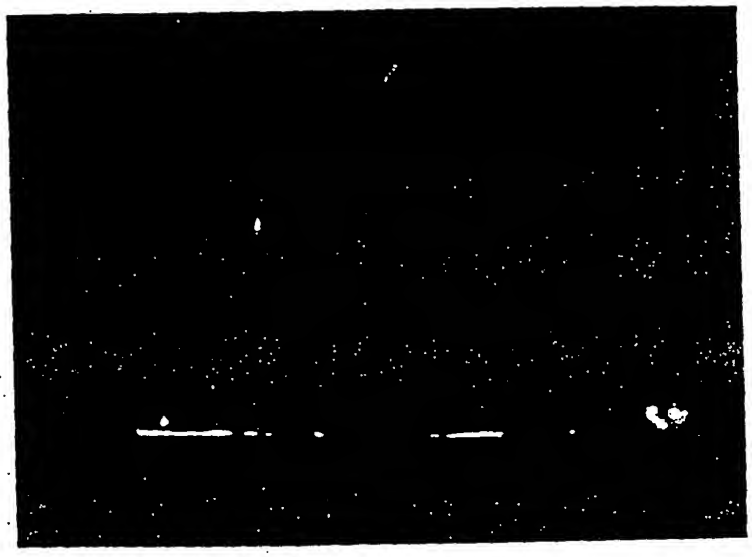


Figure 21B

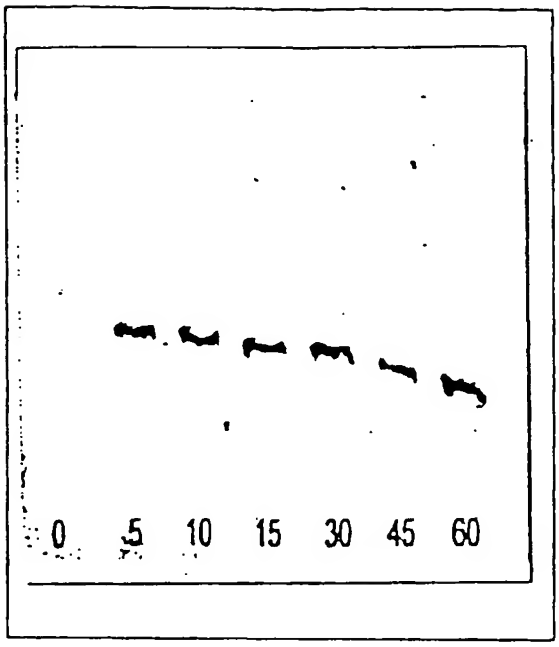


Figure 22A

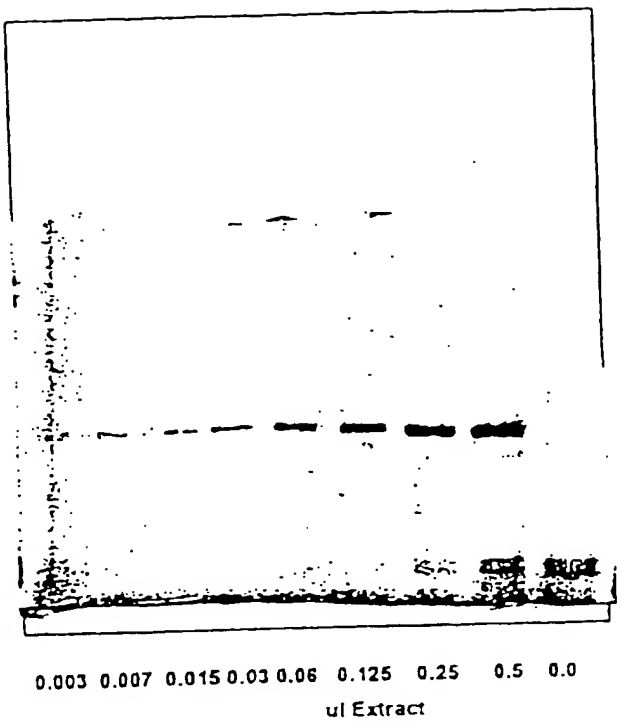


Figure 22B

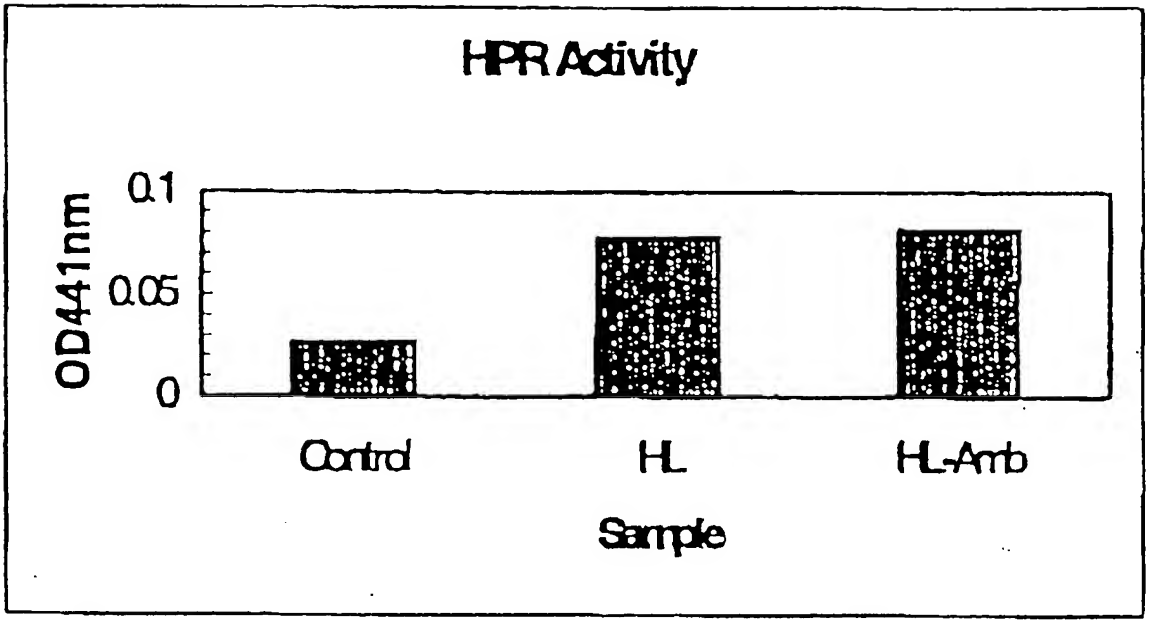


Figure 23A

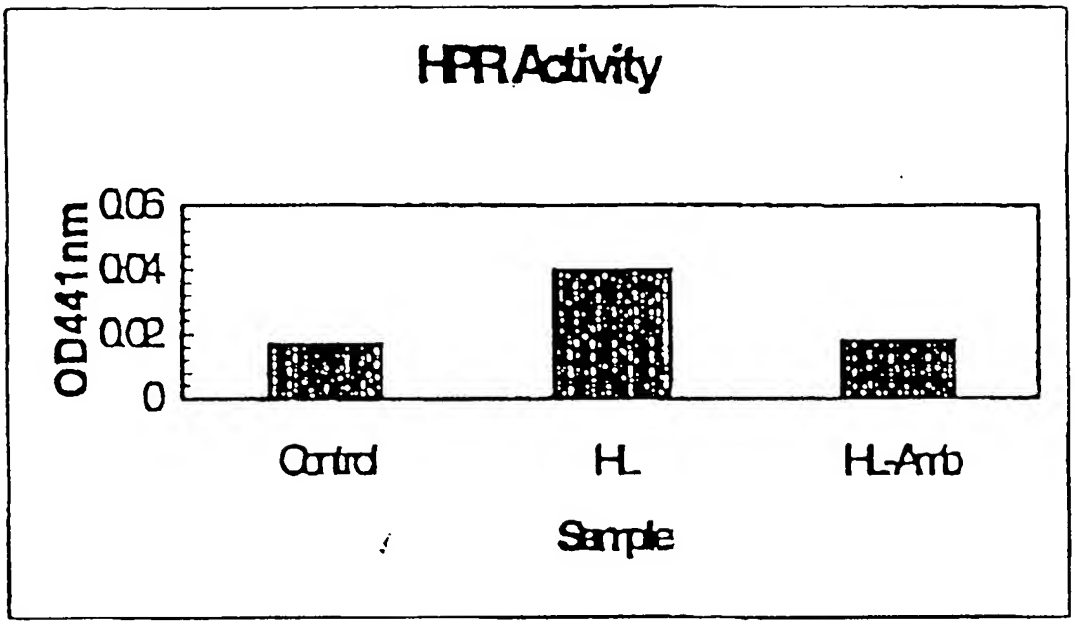


Figure 23B

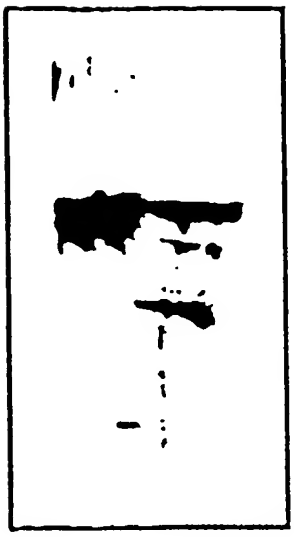


Figure 24

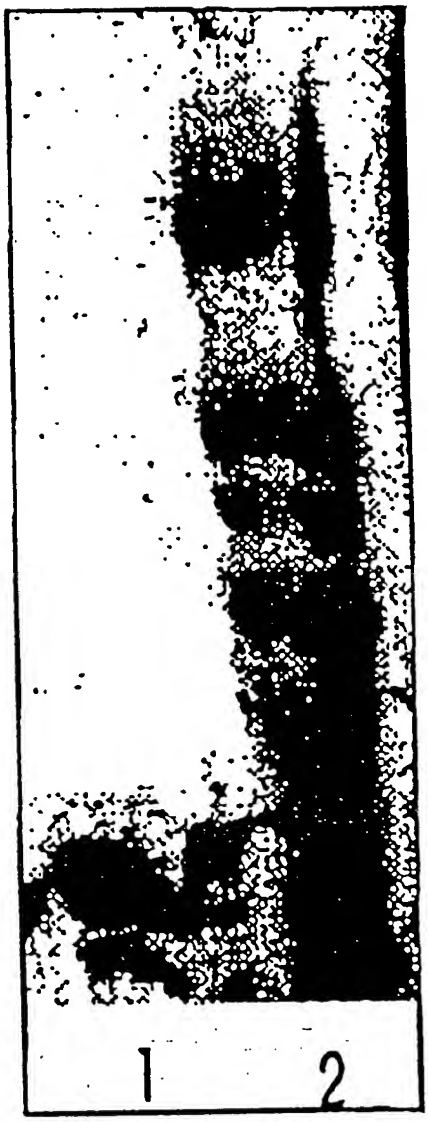


Figure 25

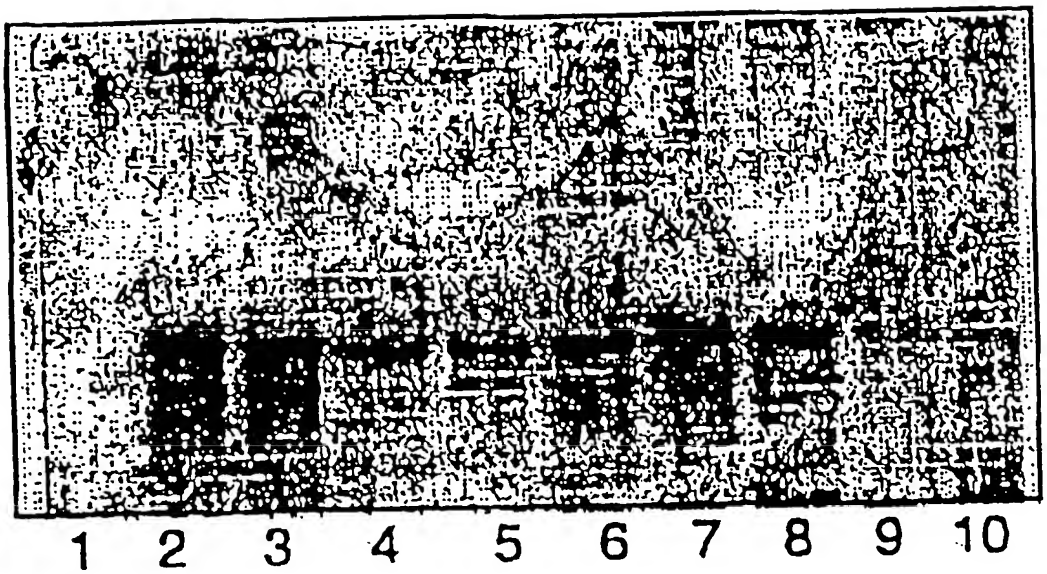


Figure 26A

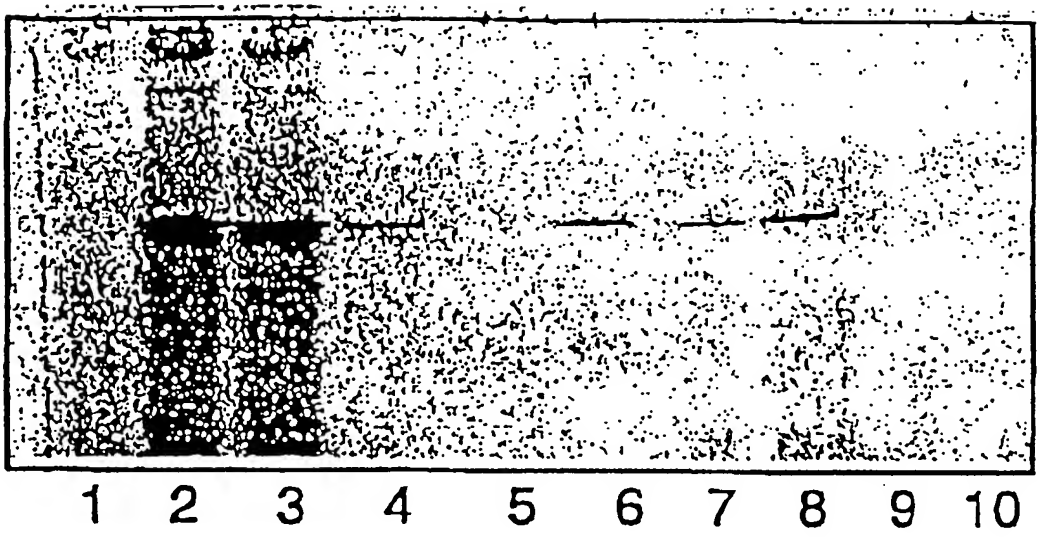


Figure 26B

Figure 27

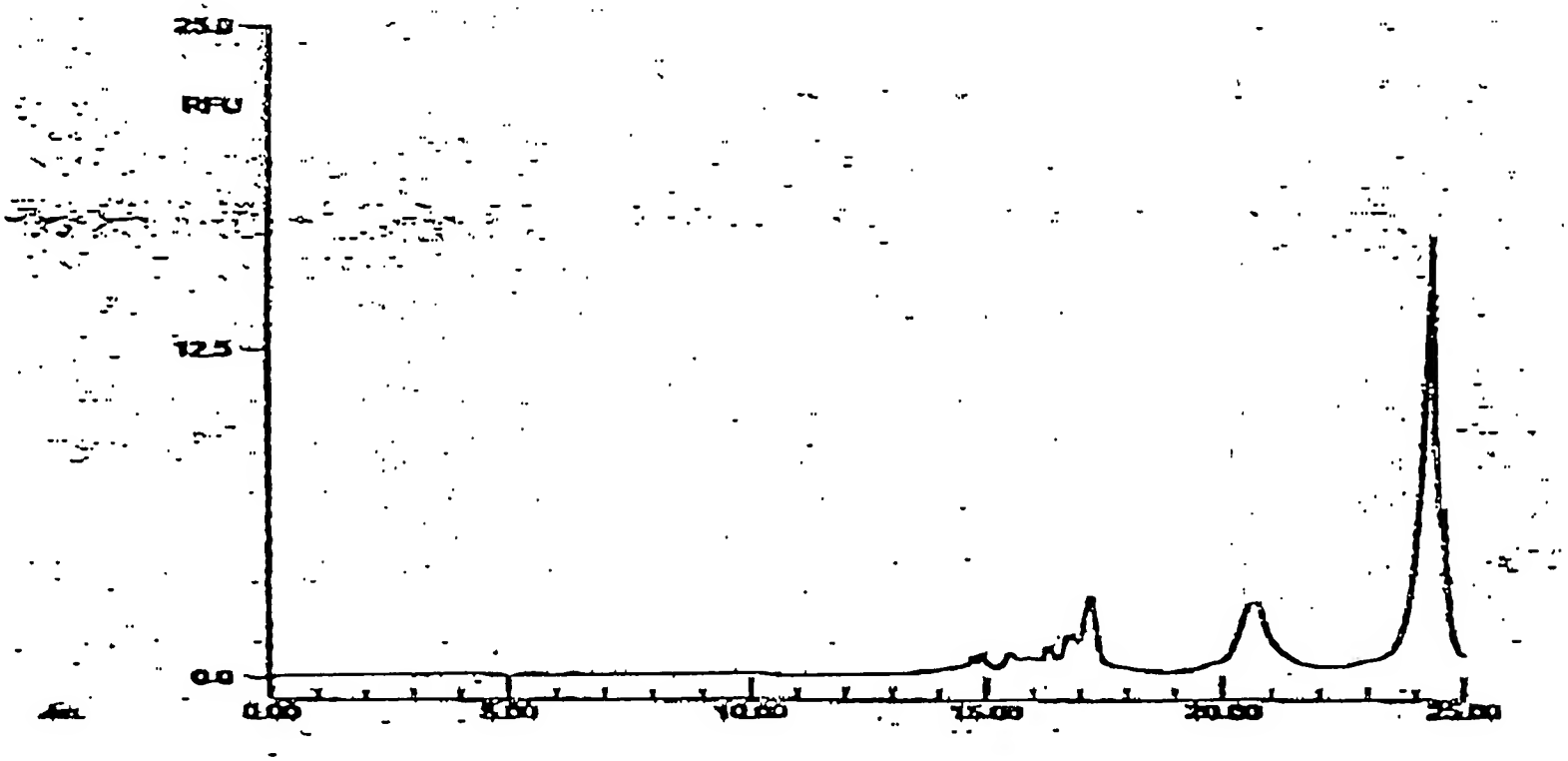


Figure 28A

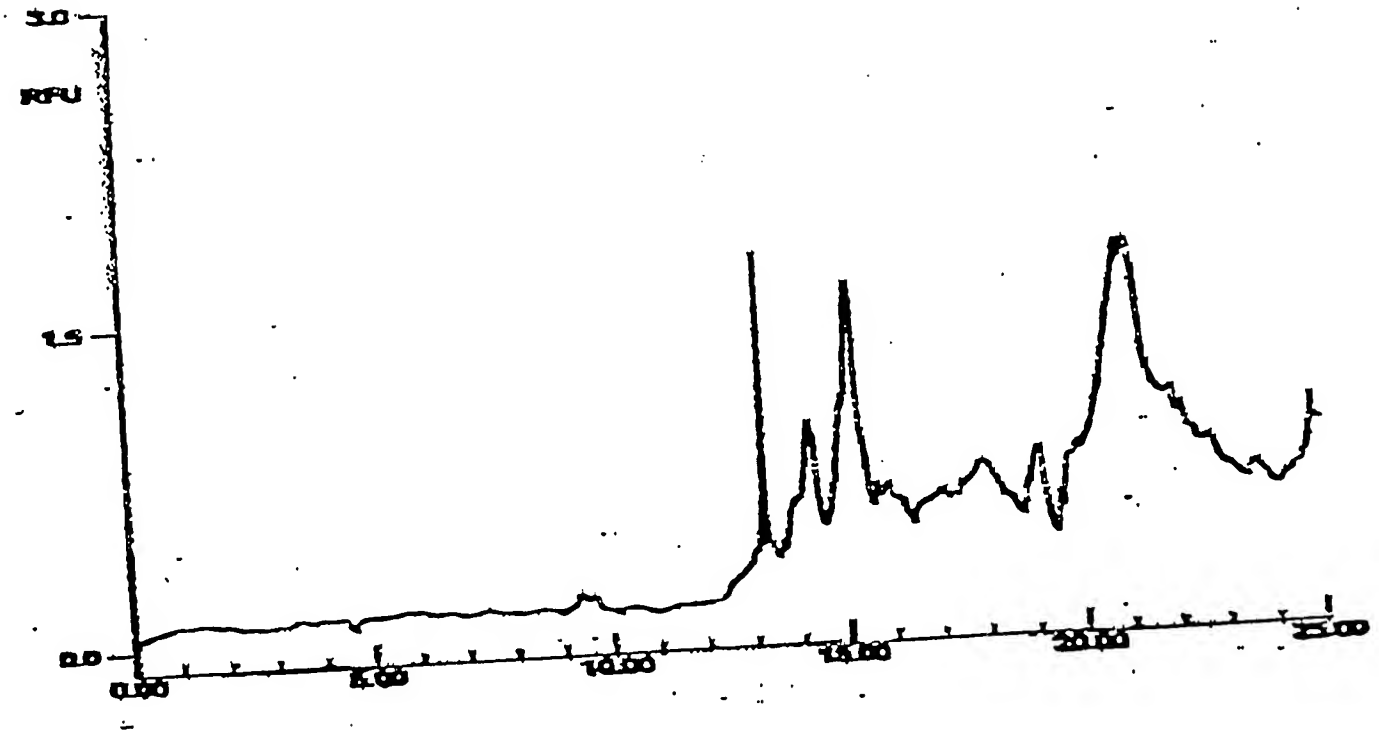


Figure 28B

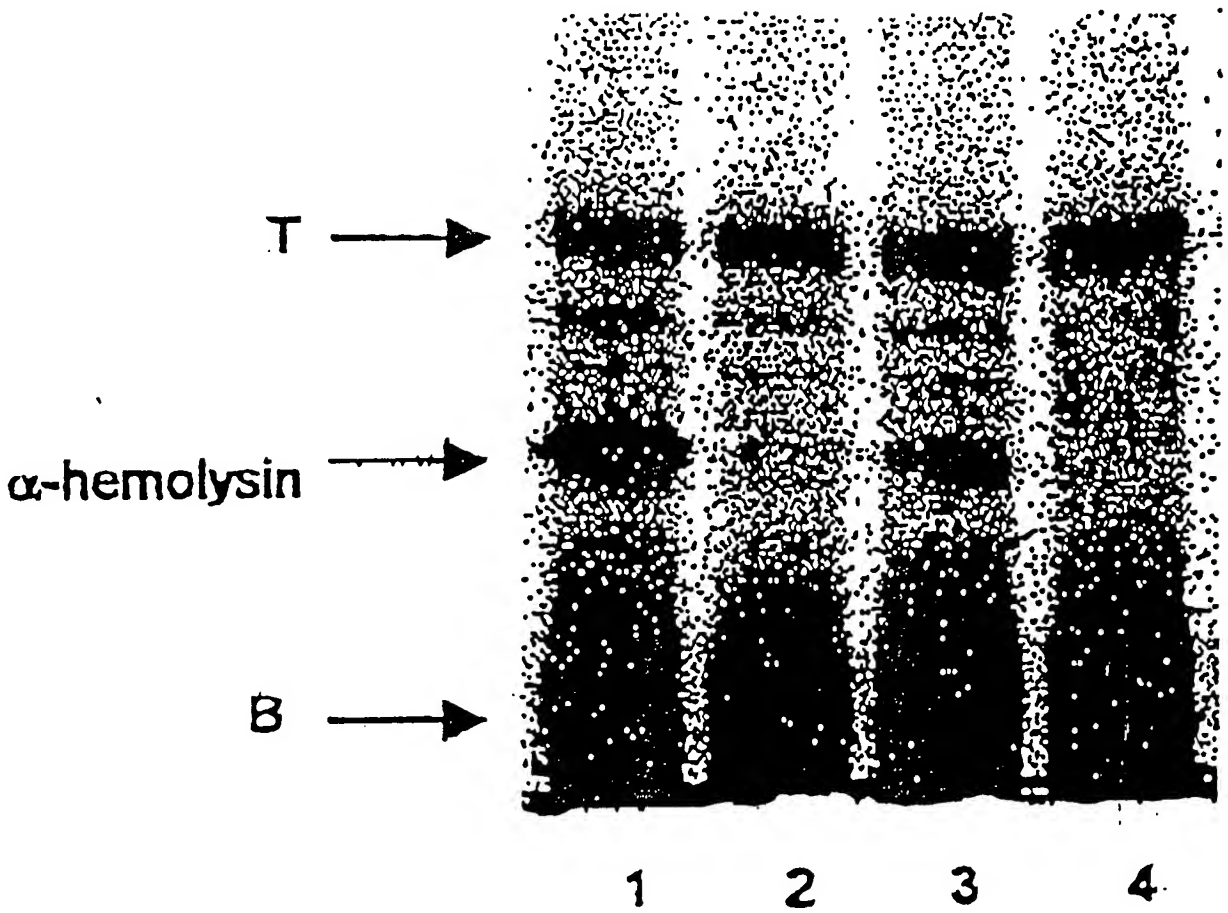


Figure 29